

REMARKS

Claims 22-35 and 42-47 are pending in the application. All claims are rejected by a non-final Office Action mailed September 28, 2009. Each pending claim rejection is rebutted in detail below.

I. *Claim Rejections- 35 U.S.C. §103*

Claims 22-35 and 47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al., *Gallium Nitride/Conjugated Polymer Hybrid Light Emitting Diodes: Performance and Lifetime*, Journal of Applied Physics, Vol. 84, No. 3, 1 August 1998, pp. 1579-1582 in view of Tuschel et al (US PUB 2005/0030545). Claim 22 has been amended herein to clarify that at least two of the multiple spectral intensity maxima emitted by the LED correspond to a detection signal and a reference signal each of which is separately detected by the two channel detector as previously claimed. Support for the amendment to claim 22 may be found in the application at page 20, lines 23-27, page 17 lines 22-26, Fig. 3F and elsewhere in the specification and figures.

Applicant respectfully submits that the combination of references relied upon by the Examiner fails to properly state an obviousness rejection since these references in combination do not show or suggest all of the elements of the rejected independent claim 22 as amended. Claims 23-35 and 47 each depend from claim 22.

In particular, claim 22 as amended states as follows:

*A detection system comprising:
a light emitting diode (LED) comprising at least one (semi)conductive electroluminescent active layer comprising at least one electroluminescent organic compound, which active layer provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light, the simultaneous emission further comprising a reference signal comprising light emitted at a wavelength corresponding to one of the at least two intensity maxima and a detection signal comprising light emitted at a wavelength corresponding to another of the at least two intensity maxima; and*

a detector comprising a signal channel configured to detect the detection signal and a separate reference channel configured to simultaneously detect the reference signal in optical communication with the LED.

A combination of references properly supporting an obviousness rejection of Claim 22, must disclose or reasonably suggest both an LED which provides for the simultaneous emission of a reference signal and a detection signal corresponding to two separate spectral intensity maxima at different wavelengths and a detector comprising a signal channel and a separate reference channel in optical communication with the corresponding channels emitted from the LED.

As detailed in the declaration made under 35 U.S.C. §1.132 of Hermannus Franciscus Maria Schoo, an inventor herein, which declaration is incorporated into this response in its entirety, the combination of references cited by the Examiner does not properly teach or suggest all of the elements recited in claim 22 as amended or the claims which depend from claim 22.

In particular, the Examiner argues that Zhang discloses a detection system having a diode which exhibits at least two intensity maxima. Applicant initially notes that Zhang does not disclose a detection system. On the contrary, the disclosure of Zhang is limited to a white light emitting LED which appears, according to Fig. 3, to be incidentally capable of simultaneously producing at least two intensity maxima.

Claim 22 and the claims which depend on claim 22 require however, a detector comprising a signal channel and a separate reference channel in optical communication with the LED. Zhang is unambiguously silent with respect to the detector element. According to the Examiner, the Tuschel reference discloses a detector in optical communication with an LED where, “one of the pixels can be used, function, or be labeled as a signal channel and another diode as a separate reference channel.” As described in detail below, and in the Declaration of Dr. Schoo, the detector of Tuschel does not, and more importantly cannot function in the claimed manner.

The examiner relies upon Figure10 and the corresponding paragraphs of the Tuschel application to support the conclusion that Tuschel disclosed a detector as claimed. It may be initially noted that Tuschel is silent with respect to the potential functionality of one of the pixels being a signal channel and another pixel being a separate reference channel. In particular, at

paragraphs [0063] to [0073] the nature of the detector element of Tuschel is explained. There is no reference whatsoever that the detection system may have or could benefit from a separate signal channel and reference channel. Moreover, the interpretation of Figure 10 and the corresponding text as suggesting these elements is inconsistent with the disclosure of Tuschel.

As described in paragraph [0064], the Tuschel device includes a filter comprising a series of filter elements. The filter elements have plates defining a cavity between the plates. The thickness of the cavity defines a selected resonant wavelength, which is allowed through the filter and which is used to obtain a spatially accurate wavelength resolved image of the sample (see also paragraph [0063]). In the final sentence of paragraph [0064] it is stated; “*The plural cavities are set to the same cavity spacing. Rays oriented normal to the plates at the resonant wavelength are passed and other wavelengths are reflected backwards along the optical path.*” Also, in paragraph [0070] where it is stated that the images detected by the detector are produced at one wavelength at a time.

As detailed in the Declaration of Dr. Schoo, it is clear from the Tuschel reference that during use only light having one wavelength at a time will be passed through and detected by the detector due to the design of the detector. In summary, the design of the detection system of Tuschel actively prohibits the simultaneous detection of light having a wavelength of a first intensity maximum and light having a wavelength of a second intensity maximum.

Accordingly, the detection system as described in Tuschel et al. cannot be a detector having a signal channel for detecting a detection signal of light at one wavelength and a separate reference channel for simultaneously detecting light at a second wavelength. The Tuschel reference, because of the filter elements which provide that only one wavelength may be passed to the detector at any given time, actively teaches away from the detector element of Claim 22 as amended.

The examiner argues that the previously presented limitation, “provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer” is merely a non-limiting field of use. Applicant respectfully disagrees. The intended use of the claimed device is appropriately contained in the preamble of Claim 22. The use of the device is as a “detection system.” The recited functional limitation concerning the simultaneous emission of at least two intensity maxima at different wavelengths of light is not a mere “intended use.” On the contrary, this recitation is an appropriate functional limitation

which properly limits the scope of all claims. For example, a detector having an LED which produces light having only one intensity maximum would clearly fall outside of the scope of Claim 22 and the claims which depend therefrom.

Functional language such as employed in Claim 22 limiting the LED element is an appropriate additional limitation in a claim. See *K-2 Corp. v. Salomon S.A.* 191 F.3d 1356, 1636, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999). See also MPEP § 2173.05(g) where it is stated:

"There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step."

Accordingly, applicant respectfully submits that the limitation "provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer" is a proper functional limitation on claim scope which must be considered by the Examiner.

The Examiner further states that applicant's functional language is treated as non-limiting since, "it has been held that in device claims the device must distinguish from the prior art in terms of structure rather than function." The Examiner cites *In re Schreiber*, 128 F.3d 143, 1477-78, 44 USPQ 2nd 1429, 1431-32 (Fed. Cir. 1997) to support this proposition. Applicant respectfully submits that the Examiner's reliance on *Schreiber* is incorrect in this case. In the *Schreiber* matter, the cited prior art disclosed structure identical to the *Schreiber* claim. In particular, the cited prior art disclosed a "dispensing top" that has a "generally conical shape and opening at each end." The *Schreiber* appellant admitted the prior art disclosed the same structure but he argued the prior art did not disclose that the structure could be used to dispense popcorn from an open ended popcorn container. Thus, the *Schreiber* appellant tried to distinguish an identical apparatus by stating that the claimed use (dispensing popcorn) was not recited in the prior art.

Interestingly, the examiner cites *In re Casey* in the second paragraph of page 3 of the office action for the proposition, "If the prior art structure is capable of performing the intended

use then it meets the claim.” In the present matter, the combination of devices cited cannot function “in the same manner.” The Tuschel device cannot pass light having two intensity maxima through the filters before the detector. The Zhang device has no detector at all. Therefore, the Tuschel device in combination with the Zhang device can never simultaneously detect separate detection and reference channels corresponding to distinct wavelength maxima.

Claims 44-46 are separately rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang and Tuschel as applied to Claim 22 and discussed above. Claims 44-46 depend from claim 22 as amended and are allowable for the reasons set forth in detail above.

For the reasons set forth above, Applicant respectfully submits the claims as filed are allowable over the art of record and reconsideration and issuance of a notice of allowance are respectfully requested. If it would be helpful to obtain favorable consideration of this case, the Examiner is encouraged to call and discuss this case with the undersigned.

This constitutes a request for any needed extension of time and an authorization to charge all fees therefore to deposit account No. 19-5117, if not otherwise specifically requested. The undersigned hereby authorizes the charge of any fees created by the filing of this document or any deficiency of fees submitted herewith to deposit account No. 19-5117.

Respectfully submitted,

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